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EXAMINER

ROY, SIKHA

ART UNIT PAPER NUMBER

2879

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,986

Applicant(s)

PARK ET AL.

Examiner

Sikha Roy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The Amendment, filed on December 29, 2003 has been entered and overcomes the rejection of claims 5,14 and 28 under 35 U.S.C. § 112, second paragraph.

Cancellation of claim 2 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4 – 6, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

Referring to claim 1 applicants' admitted prior art discloses (specification page 4 Fig. 1) an electroluminescent device comprising a transparent substrate 1, a plurality of pixel areas including plurality of scanning lines and data lines formed on the substrate, plurality of pixel electrodes 2a formed on the plurality of pixel areas, electroluminescent layer 3 formed over the pixel electrodes, a metal electrode 4 formed on the electroluminescent layer, a protective film 5 over the metal electrode, a seal cover plate 7 for sealing the EL layer and a sealant 6 for adhering the seal cover plate 7 to the transparent substrate 1.

The applicants' admitted prior art does not disclose the heat-exhausting layer formed on the metal electrode.

Yang in analogous art of organic polymer displays discloses (abstract, column 2 lines 5-10 Fig. 2C) an organic polymer EL display with a heat exhaust (dissipating) layer 28 formed on the metal electrode (cathode). It is to be noted that heat generated during the operation of the display results in disintegration of the organic layers limiting the lifetime of the display. Yang discloses that by using this heat-dissipating layer the heat generated by the EL display can be dissipated and hence the lifetime of the display can be enhanced.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the heat exhaust layer formed on the metal electrode between the metal electrode and the protective film, as taught by Yang to the electroluminescent display disclosed by applicants' admitted prior art for dissipating heat generated by the EL display and hence enhancing its life.

Referring to claim 1, applicants' admitted prior art and Yang fail to disclose the protective film having multi-layer structure of at least a moisture-absorbing layer and a moisture-proof layer.

Gyotoku in analogous art of organic electroluminescence element discloses (column 4 lines 32-46, column 7 lines 33-36, column 9 lines 5-15 Fig.6) an organic electroluminescent element having a protective film of laminate film of two layers (7a,7b) or more having an insulating compound GeO, SiO, SiO₂ (known as silica gel which is moisture absorbing) in the lowest layer and a metal film formed on the

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insulating compound layer. Gytoku discloses that in this constitution invasion of moisture (moisture proof) into the cathode or organic thin film is completely shut-off, growth of dark spots on the luminous layer is prevented, thereby presenting an organic electroluminescent element capable of suppressing gradual decline of luminance. Gytoku further notes (column 9 lines 53-57) that this two-layer structure of the protective layer can be formed easily and transitional decline of luminance can be effectively prevented.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the protective film of applicants' admitted prior art and Yang to a protective film of laminate of two or more layers having moisture absorbing and moisture proof layers as taught by Gytoku for easy formation of the protective layer and preventing transitional decline of luminance of the electroluminescent element.

Claim 3 essentially recites the same limitations as of claim 1 with the protective film having single-layer structure. Gytoku discloses in Fig. 5 the protective layer 7 having single layer structure having insulating compound layer GeO , SiO , SiO_2 (known as silica gel which is moisture absorbing).

Regarding claims 4-6, applicants' admitted prior art discloses (Fig.1 page 4 [0013]) a moisture absorbing agent 8 formed of fine powder containing any one of BaO , CaCO_3 , silica-gel, alumina is provided at the inside of the seal cover plate opposed to the metal electrode to absorb moisture and oxygen from the electroluminescent layer. It is further disclosed (page 4 lines 9-11) a supporting film 9 formed from semi-transmitting

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film is used for adhering the moisture absorbing agent to the inner side of the seal cover.

Regarding claim 9, here the applicant is claiming the product of electroluminescent device including a method (i.e. a process) of making the heat-exhaust layer, consequently, claim 9 is considered "product-by-process" claim. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Further, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. As such, no patentable weight has been given to the process recited in claim 9 (see MPEP 2113).

Claims 10,11,13-15 and 18,19-21,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 6,383,048 to Yang et al.

Regarding claim 10 applicants' admitted prior art discloses all the limitations except a heat-exhausting layer formed on the seal cover plate.

Yang in Embodiment 2 discloses (Fig. 3D column 4 lines 55-60) a heat-exhausting layer 40 consisting of a high thermal conductivity metal such as copper deposited on top of the organic polymer EL display. Yang further notes that this layer enhances the effect of heat-dissipation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a heat-exhausting layer as taught by Yang on the seal cover

plate of the EL device of applicants' admitted prior art for enhancing the effect of heat-dissipation from the device.

Regarding claim 11 the applicants' admitted prior art discloses (page 4 line 8 Fig.1) a protective film 5 is formed on the metal electrode 4.

Claim 13-15 recite the same limitations as of claims 4-6 and hence are rejected for the same reasons (see rejection of claims 4-6).

Claim 18 recites the same limitations as of claim 9 and hence is rejected for the same reason (see rejection of claim 9).

Referring to claim 19 applicants' admitted prior art and Yang disclose the claimed invention except for the heat exhausting layer formed on the protective film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange the heat exhausting layer on the protective film, since it has been held that rearranging parts of the invention involves only routine skill in the art.

Referring to claim 20 the applicants' admitted prior art discloses (Fig. 1) the seal cover plate provided on the protective film 5 and a sealant for adhering the seal cover plate to the transparent substrate. As the protective film has the heat exhaust layer formed on the protective film, it would have been obvious to specify the seal cover plate provided on the heat exhaust layer sealing the electroluminescent layer and adhered to the transparent substrate by a sealant.

Regarding claim 21, the heat exhaust layer being formed on the protective film, protects the protective film underneath.

Claim 25 recites the same limitations as of claim 9 and hence is rejected for the same reason (see rejection of claim 9).

Claim 26 - 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 5,811,177 to Shi et al.

Claim 26 differs from applicants' admitted prior art in that applicants' admitted prior art does not disclose a metal thin film provided on the seal cover plate.

Shi in relevant art of electroluminescent organic devices discloses (Figs. 4,5 column 3 lines 40-63, column 4 lines 5-30) discloses a metal thin film layer 26 (low permeability inorganic layer of a stable metal such as aluminum) under the seal plate 30. Shi further discloses this metal film has low permeability of oxygen and moisture and hence yields overall structure with a better encapsulation and resistance to permeation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to provide a thin metal film under the seal cover plate of the device of applicants' admitted prior art as taught by Shi et al. for better encapsulation of the device.

It is elementary that mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses

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the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. *In re Swinehart*, 169 USPQ 226 (CCPA 1971). Thus, the functional limitation of metal thin film to 'smoothly transfer heat' is taught by Shi under the principles of functional inherency.

Claims 27 - 29 recite the same limitations as of claims 4-6 and hence are rejected for the same reasons (see rejection of claims 4-6) as disclosed in applicants' admitted prior art.

Referring to claim 30 Shi discloses the metal thin film adhering the entire surface of the seal cover plate.

Regarding claims 31 and 32 the applicants' admitted prior art and Shi disclose the claimed invention except for the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed. It would have been an obvious matter of design choice to have the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed since the applicant has not disclosed that this design of the thin metal film solves any stated problem and it appears that the invention would perform equally well with the thin film covering the entire seal cover plate.

Regarding claim 33 applicants' admitted prior art discloses (page 4 lines 14-17, Fig. 1) the sealant for adhering the seal cover plate and the metal film is epoxy resin which is known in the art to be an ultra-violet hardening (curing) resin.

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Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

Claims 12 and 22 essentially recite the same limitation of claim 3 and hence are rejected for the same reason.

Alternatively claims 3, 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,172,458 to Nakaya et al.

Claim 3 differs from applicants' admitted prior art and Yang in that they do not exemplify the protective film having single-layer or multi-layer structure of moisture absorbing or moisture-proof layer.

Nakaya in pertinent art of organic electroluminescent device discloses (column 7 lines 13-25) a layer of protective film with a certain thickness preventing the penetration of moisture. Nakaya further discloses this protective film also provides prevention of oxidation of the electron-injecting electrode and hence stable driving period of the organic EL device is enhanced.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include moisture-proof layer as taught by Nakaya in the protective film of the applicants' admitted prior art and Yang for preventing moisture penetration and oxidation of the electron-injecting electrode and hence enhancement of stable driving period of the organic EL device.

Claims 12 and 22 recite the same limitation as of claim 3 and hence are rejected for the same reason.

Claims 7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art, U.S. Patent 6,383,048 to Yang et al. and U.S. Patent 6,195,142 to Gytoku et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Referring to claims 7 and 8 Yang discloses AlN_x , a high thermal conductivity material used for heat exhaust layer but do not disclose the heat exhausting material formed of carbon group material.

Gledhill in pertinent art of providing elastomer surfaces on supporting substrates discloses (column 10 lines 9-18) coating of carbon dag or graphite used for heat absorbent properties.

The selection of known materials for a known purpose is generally considered to be within the skill of the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the heat exhaust layer of AlN_x of Yang formed of carbon material for its heat-absorbent properties as disclosed by Gledhill because the selection of known material for a known purpose is within the skill the art.

Regarding claim 8 Gledhill discloses (column 5 lines 33-35) graphite film used commercially as heat absorbent coating.

Claims 16,17 and 23,24 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Claim 16, 17 recite the same limitations as of claims 7,8 respectively and hence are rejected for the same reasons (see rejection of claims 7,8).

Claim 23, 24 recite the same limitations as of claims 7,8 respectively and hence are rejected for the same reasons (see rejection of claims 7,8).

Response to Arguments

Applicant's arguments with respect to claim1 have been considered but are moot in view of the new ground(s) of rejection.

Applicants' arguments with respect to claim 3 have been fully considered but they are not persuasive. In response to applicants' argument that Nakaya does not teach or suggest a protective film has a single-layer structure of a moisture proof layer the examiner respectfully disagrees. Nakaya indeed discloses (Fig. 1 column 7 lines 13-15,40-47) a protective layer 26 comprising a protective film having a certain thickness to ensure prevention of penetration of moisture formed on the metal cathode. Applicants' admitted prior art and Yang teach a heat-exhausting layer formed on the metal electrode. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a protective film of single layer structure as taught by

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Nakayama on the heat-exhausting layer of applicants' admitted prior art and Yang for preventing penetration of moisture into the device.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,635,989 to Nilsson et al. discloses multi-layer of protective film formed on the metal electrode. U.S. Patent 5,882,761 to Kawami et al. discloses silica gel absorbs moisture.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.R.

Sikha Roy
Patent Examiner
Art Unit 2879


ASHOK PATEL
PRIMARY EXAMINER